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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

SUMMER TERM / MAKE UP ENDTERM EXAMINATION

Semester: Summer Term 2019

Date: 24 July 2019

Course Code: EEE A 104

Time: 3 Hours

Course Name: Electrical Sciences

Max Marks: 100

Program & Sem: B.Tech. & I Sem (2016 Batch)

Weightage: 50%

Instructions:

- i. Answer all the questions.

Part A

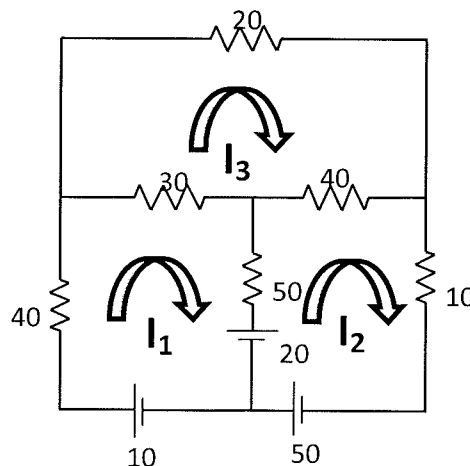
Answer **all** the Questions. **Each** Question carries **five** marks (3Q x5M=15M)

1. Derive the expression for the power consumed in the pure inductive circuit.
2. A 230 V, 50 Hz ac supply is applied to a coil of 0.06 H inductance and 2.5Ω resistance connected in series with a $6.8 \mu\text{F}$ capacitor. Calculate (i) Impedance (ii) Current (iii) Phase angle between current and voltage.
3. A coil of 250 turns, wound on a core of non-magnetic material, has an inductance of 20 mH. Calculate: (a) the flux produced by a current of 10 A; (b) the average value of the e.m.f. induced when a current of 10 A is reversed in 10 ms (milliseconds)

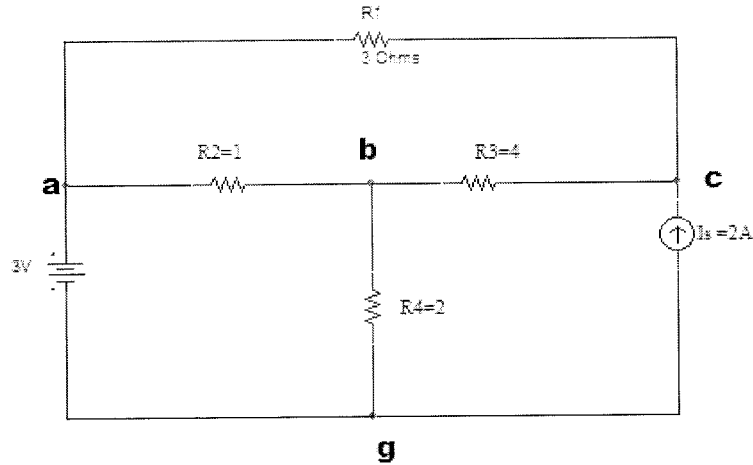
Part B

Answer **all** the Questions. **Each** Question carries **fifteen** marks. (3Qx15M=45M)

4. With a neat circuit diagram and wave form explain the construction and working of the BRIDGE TYPE full wave rectifier. Show that the efficiency is 81%
5. Calculate the current through each resistor of the network shown in the figure using mesh analysis.



6. For the circuit shown in the below figure, find the current I_{ab} and voltage (V_{cg}) across the current source using superposition theorem.



Part C

Answer the Question. **The Question carries twenty marks.**

(1Qx20M=20M)

7. The current in a circuit is $(8-j10)$ A when the applied voltage is $(50+j25)$ volts. Determine
- The magnitude of the current;
 - Impedance;
 - The circuit elements;
 - Power factor and
 - Power.

Part D

Answer the Question. **The Question carries twenty marks.**

(1Qx20M=20M)

8. A network consists of three branches in parallel. Branch A is a 10 ohms resistor, branch B is a coil of resistance 4 Ohms and inductance 0.02 H, and branch C is an 8 ohms resistor in series with a 200 micro Farad capacitor. The combination is connected to a 100 V, 50 Hz supply. Find the various branch currents and then, by resolving into in-phase and quadrature components, determine the total current taken from the supply. Draw a phasor diagram showing the relative positions of the various circuit quantities. It need not be drawn to scale.